FORUM 82

THE FUTURE OF VERTICAL FLIGHT

MAY 5–7, 2026 | WEST PALM BEACH, FL, USA

CALL FOR PAPERS

The Vertical Flight Society (VFS) is proud to announce its 82nd Annual Forum & Technology Display — the world's leading international conference on vertical flight technology. Forum 82 offers a platform to present and discuss the latest advancements in vertical flight research, development, regulations, and applications.

FORUM TECHNICAL LEADERSHIP

Forum 82 Chair: **Prof. Karen Feigh**, Georgia Institute of Technology (karen.feigh@gatech.edu).

Forum 82 Deputy Chair: **Marc Alexander**, National Research Council of Canada (marcdavid.alexander@nrc-cnrc.gc.ca).

This **Call for Papers** invites abstracts to be submitted for consideration by any of the Society's 21 technical committees or History:

- Acoustics
- Advanced Vertical Flight
- Aerodynamics
- Aircraft Design
- Autonomy & UAS
- Avionics & Systems
- Crash Safety
- Crew Stations & Human Factors
- Dynamics
- Electric VTOL (eVTOL)
- Handling Qualities
- History
- Integrated Vehicle Health Management
- Manufacturing Technology & Processing
- Modeling and Simulation
- Operations & Infrastructure
- Product Support Systems Technology
- Propulsion
- Safety
- Structures & Materials
- Systems Engineering
- Test & Evaluation

IMPORTANT DATES:

Now October 20, 2025 Abstract Submission Deadline

December 2025 Author Notification of Paper Selection

April 3, 2026 Final Written Paper Deadline

IMPORTANT LINKS:

Mira Forum 82 Abstract and Final Paper Submissions: www.submissions.mirasmart.com/VFS2026/Login.aspx

VFS Forum 82 Information: www.vtol.org/forum

CONTACT:

Julie M. Gibbs, VFS Technical Programs Director: jmgibbs@vtol.org

ABSTRACT SUBMISSION GUIDELINES:

- **Deadline extended Oct. 20, 2025.** Submitted to the Forum 82 Mira site www.submissions.mirasmart.com/VFS2026/Login.aspx.
- **Submitting an abstract is a professional commitment. If accepted, the author agrees to submit a final paper and attend the Forum in-person to present it.**
- Abstracts must summarize the background, present figures and illustrations where applicable, and outline the expected key conclusions.
- Use the required abstract templates, available at: www.submissions.mirasmart.com/VFS2026/Login.aspx and the Forum 82 site www.vtol.org/forum.
- **Abstracts should be a minimum of three (3) pages and a maximum of 5-pages in length**. *Note, some technical committees have specific length requirements — refer to committee descriptions for details.*
- Authors should present no more than two papers at the Forum.

ABSTRACT ACCEPTANCE WILL BE BASED UPON THE FOLLOWING:

- Work that represents new vertical flight technology advancements and/or reports significant new information.
- Technical quality and relevance, topic appropriateness, originality, research value, and completion status.
- Work in progress must be cited appropriately, specifying how proposed content differs from prior publication (if any).

FINAL PAPER SUBMISSION DETAILS:

- **Final papers due: April 3, 2026.**
- All final papers and presentations must be completely unrestricted – the Forum is an international event.
- Each paper will be assigned a DOI number and published.
- **Copyright**:
  - VFS retain copyright ownership of Forum papers.
  - Authors retain the right to republish or reuse content in future work.
  - U.S. government employees and other organizations obtain copyright to extent allowable.
- **Policies:**
  - *"No Paper, No Podium" and "No Podium, No Paper" Policies*: failure to submit or present will result in removal from publication
  - Late paper submissions are ineligible for Best Paper Awards.
- **Forum Registration**: all presenters must register and pay the applicable fee, and a discount rate is available for speakers.

BEST PAPER AWARDS

- The best paper in each technical discipline will receive a Best Paper Certificate.
- The overall top paper will receive the *Alfred Gessow Best Paper Award,* and the main author will be invited to present it at the European Rotorcraft Forum (ERF) in September 2026.

ANNUAL FORUM TECHNICAL SESSIONS

ACOUSTICS

Papers are sought addressing recent advances in the study of rotorcraft acoustics and their related fields. Research into crewed or uncrewed vehicles that focus on external and internal noise generation, propagation, control (active and passive), and community impact for rotorcraft, vertical take-off and landing (VTOL) and advanced air mobility (AAM) vehicles, and similar topics in wind turbine noise are also welcome. Other topics of interest include:

- Research contributing to a basic understanding of fundamental aerodynamic noise sources
- Noise measurement, modeling, and prediction research that advances the state of science
- Acoustic aspects of issues that could transform, revolutionize or facilitate concepts for the future of vertical flight
- Development or implementation of national or international civil noise regulations

***Exterior* noise topics include:**

- Vehicle component and full system noise prediction methodology development and validation
- Wind tunnel and flight test acoustics measurements
- New procedures for acoustic data acquisition and analysis
- Active and passive noise reduction technologies
- Noise abatement flight operations
- Interaction between various noise sources for vertical flight vehicles
- Acoustic propagation models
- Impact of vehicle noise on the community and human response to noise

***Internal* noise topics include:**

- Application of numerical techniques to predict noise in vehicle cabins
- Active and passive noise control technologies to reduce cabin noise
- Studies of human response to cabin noise
- Concepts for reduction of engine, transmission, or motor noise

Session Chair: Lauren Weist, NASA Ames Research Center, lauren.p.weist@nasa.gov

Deputy Session Chair: Sicheng (Kevin) Li, Oklahoma State University, sicli@okstate.edu

ADVANCED VERTICAL FLIGHT

Papers are sought addressing novel, innovative configurations, and transformational technologies for vertical flight vehicles. The committee invites research into the applications of advanced and emerging technologies to enable transformational capabilities beyond that of current state-of-the-art and production VTOL aircraft. Novel designs to meet unique mission requirements, for example, human-powered, tube-launched, extraterrestrial, or other unconventional applications, are also encouraged. Examples include:

- Flapping or biologically inspired aircraft
- Thrust/lift-compounded aircraft
- Slowed/stopped-rotor aircraft
- High-speed VTOL aircraft
- Multirotor or unique rotor configurations
- Novel propulsion, such as hybrid and/or electric aircraft
- Extraterrestrial aircraft

In addition, papers on technological advances in unconventional vehicles are encouraged and examples include: advanced propulsion systems, aerodynamic enhancements, and structural efficiency improvements that enable novel configurations are also welcome as well as research on the modelling, simulation, and analysis of such configurations.

Session Chair: Chloe Johnson, University of Maryland, chloej@umd.edu

Deputy Session Chair: Michael Strauss, Sikorsky, a Lockheed Martin Co., michael.strauss@lmco.com

AERODYNAMICS

High-quality papers are invited that address recent accomplishments in all areas of aerodynamics related to the future of vertical flight. **Abstracts exceeding 5 pages (10 pt., single- spaced, 1 inch margins, all-inclusive) will not be evaluated**. Authors are encouraged to use the full five pages to allow for sufficient detail and increase the chance of acceptance. Topics of interest include, but are not limited to:

- Computational fluid dynamics (CFD) techniques
- Analytical methodologies
- Experimental aerodynamics and/ or flight test results
- Flow visualization methods
- Correlation and uncertainty quantification
- Aerodynamic design methods
- Unique aerodynamic modeling
- Interactional aerodynamics
- Low Reynolds number aerodynamics
- Aerodynamic flow control
- Unsteady, high angle of attack or vortical flows

Session Chair: Dr. David O'Brien, US Army DEVCOM AvMC, david.m.obrien48.civ@army.mil

Deputy Session Chair: David Farish, Naval Air Systems Command (NAVAIR), david.m.farish.civ@us.navy.mil

AIRCRAFT DESIGN

Papers are sought addressing the design of crewed or uncrewed VTOL aircraft, their major systems, and components. Papers discussing the application of technologies, the interaction of technology, configuration, and requirements in the design of next generation aircraft are also welcome. Specific topics of interest include:

- Conceptual and detail design of vehicle, airframe, dynamic components, and major subsystems, and trade-off analysis as part of the design process
- Integration of novel propulsion, control effectors and modular payloads/weapons
- Development of design optimization methodology using low- to high-fidelity computational simulation tools
- Application of high-fidelity CFD simulation methods to support vehicle or system design
- AI/ML surrogate modeling applied to the design process
- Lessons learned from actual design realization

Session Chair: Prof. Sang Joon Shin, Seoul National University, ssjoon@snu.ac.kr
Deputy Session Chair: Dr. Jason Cornelius, Perseus Defense, jason@perseusdefense.com

AUTONOMY & UNCREWED AIRCRAFT SYSTEMS (UAS)

Papers are sought addressing concepts, design, development, operation, and robotics aspects of VTOL and rotary-wing UAS in the following general areas:

- Autonomy and software architecture
- Reliability and robustness
- Payloads and sensors, including applications such as Intelligence, Surveillance, and reconnaissance (ISR), cargo, etc.
- Agility and performance
- Survivability
- Operability
- Operations in shipboard environments (deck motion and wind gusts)

Other topics of interest include:

- Guidance, navigation, and control (with and without GPS)
- Alternate navigation methods
- Data driven approaches and machine learning methods for autonomy
- Autonomy driven design concepts, including small uncrewed aircraft systems (sUAS), micro air vehicles (MAVs), and launched effects (LE)
- Mechatronic integration
- Reasoning and higher-order decision making
- Swarming, teaming, and multi-vehicle fusion
- Autonomous operation, tasking, and control (C4)
- Manned-unmanned teaming
- flight testing, modelling, and simulation
- Data links and communications
- Airworthiness, safety and certification, operation in civil airspace
- International cooperation and compatibility

Session Chair: Dr. Alexei Masterov, Daedalean Inc., aim@daedalean.ai

Deputy Session Chair: TBD

AVIONICS & MISSION SYSTEMS

Papers are sought addressing software, mission, flight, or avionics systems for crewed, uncrewed, or optionally crewed vertical flight aircraft. Topics of interest include:

- Aspects of mission, flight, or avionics management systems including hardware, firmware, and software design, testing, development, fielding/deployment, or successes/challenges/lessons learned
- Integration of net-centric operations, sights and sensors, weapons and armament, navigation and communications, aircraft survivability, aircraft management, controls and displays, data management (concentration or collection), data links, or electronic warfare systems
- Complex software intensive, partitioned, or multi core avionics, mission, or flight systems including cognitive decision aiding, machine learning, artificial intelligence, automation/augmentation, and degraded visual environments (DVE) or "all weather operation" including synthetic vision, image or data fusion, use of advanced sights and sensors
- Cyber security, anti-tamper, GPS denied environments, information assurance, and aspects of DevSecOps and/or MLOps
- Avionics component or system test and qualification methods, including modeling and simulation, especially as applicable to safety, airworthiness certification, or other aspects of qualification
- Fly by wire and fly by light flight control system architectures including advanced electrical controls, actuators, and emerging technologies
- Innovative technologies from other industries such as automotive, nautical, or internet of things applicable to mission, avionics, flight, ground systems, or software systems that enhance the capabilities of vertical lift aircraft
- Open systems architecture initiatives, technologies, and applications within rotorcraft or adjacent airborne aircraft (e.g., fighter) systems. Initiatives and technologies including, but not limited to MOSA, FACE, OMS, HOST, SOSA and IMA architectures. Applications of OSA including proactive obsolescence management, enabling capability upgrade or replacement, and product line engineering.
- Electrical power generation, distribution, and control

Session Chair: **Grace Chrysilla**, The Boeing Company, grace.chrysilla@boeing.com

Deputy Session Chair: **Chris Thornberg**, Sikorsky, a Lockheed Martin Co., chris.a.thornberg@lmco.com

CRASH SAFETY

Papers are sought addressing all aspects of crashworthiness and aviation occupant safety relating to rotorcraft, uncrewed aircraft systems (UAS), and other vertical and/or short takeoff and landing (V/STOL) aircraft in applications such as military, civil, offshore transport, advanced air mobility (AAM), mountainous terrain, emergency medical services, and law enforcement. Of key interest are system integration analyses that demonstrate enhanced occupant safety. Emphasis will be given to the recent development of new crash safety concepts and technologies focused on:

- Minimizing human impact injury
- Maximizing post-crash survival
- Development of crash-resistant design criteria
- Addressing chronic injury potential related to crash-protective systems
- Development and application of comprehensive human tolerance and injury criteria
- Development of systems that reduce airframe damage while also reducing injury potential
- Effects of the application of transient dynamic loading on aircraft structure and mission equipment due to impact or crash (e.g., bird strike or cargo system loading)

Additional topics of interest include:

- Advances in energy absorbing systems such as landing gear
- Composite airframe structures, seats, cargo and mass item retention systems, and internal/external inflatable devices
- Crew, troop, and passenger restraint systems
- Multi-terrain impact analysis and testing including ditching and flotation stability
- Impact of crash-resistant fuel systems to include range extension tanks
- Methods of mishap data retrieval, collection and analysis; use of mishap data to define crash safety technology deficiencies and support system safety analyses
- Numerical techniques for crashworthiness including occupant modeling, simulation of aircraft impacts, aircraft crash protective systems such as landing gear, energy-absorbing seats, inflatable devices; validation methods for acceptance of these results

Session Chair: **Dr. Joseph Pellettiere**, Federal Aviation Administration, joseph.pellettiere@faa.gov

Deputy Session Chair: **Jason Fait**, BAE Systems, jason.fait@baesystems.com

CREW STATIONS & HUMAN FACTORS

Papers are sought addressing all aspects of air vehicle crew stations and/or human factors engineering. Topics of interest include:

- New designs facilitating hands on/eyes out operations
- Cockpit environment for extended mission times, such as air conditioning, noise reduction, vibration reduction, etc.
- Flight controls that reduce workload or simplify the pilotage task
- Innovative flight control and/or mission grip design
- Cognitive decision aiding and automation
- Reducing long-term injury to pilots due to vibration, head-borne weight of goggles, etc.
- Cueing and pilot input needed to transition from autonomous flight to manual control and back
- Improved situation awareness and information management techniques
- New and innovative visual displays, large area displays, touch interfaces, 3D displays
- Graphical user interface designs and information management
- Tactile cueing
- Voice recognition and auditory displays, advances in 3D audio
- Secure and night vision goggle compatible crew station lighting
- Uncrewed air system ground station human machine interface designs
- Workload, stress and fatigue assessment, and impact on crew performance
- Human machine interface design for maintainer
- MIL-STD-1472, MIL-L-85762, MIL-STD-3009 and RTCA DO-275 compliance assessment
- Methods for minimizing design-related errors by the flight crew / enable flight crew to detect and manage errors that do occur

Session Chair: **Douglas Fischer**, The Boeing Co., douglas.s.fischer@boeing.co

Deputy Session Chair: **Cameron Gibbons**, The Boeing Co., cameron.t.gibbons@boeing.com

DYNAMICS

Papers are sought addressing all areas related to rotorcraft dynamics and aeroelasticity. Priority will be given to completed programs where significant conclusions are substantiated, and the results contribute to advancing the state-of-the-art. Papers reporting on the following topics are of particular interest:

- Development of rotorcraft dynamic or aeroelastic analyses, experimental validation, and new experimental results
- Advances in dynamics technology and design methodologies
- Advances in active and passive vibration reduction techniques
- Dynamic aspects of technologies such as adaptive rotors, UAS/MAVs, eVTOL, and unconventional V/STOL aircraft, including multi-state/optimal trim and control approaches for advanced configurations
- Prediction of loads, vibration, and stability using coupled CSD/CFD analysis

Other topics include:

- Rotor response and stability
- Dynamics of coupled rotor/airframe system
- Loads prediction
- Analytical modeling techniques
- Experimental measurements
- Reduced order models

Session Chair: **Dr. Jimmy C. Ho**, US Army, jimmy.c.ho2.civ@army.mil

Deputy Session Chair: **Dr. Yan Skladanek**, Airbus Helicopters, yan.skladanek@airbus.com

ELECTRIC VERTICAL TAKEOFF & LANDING (eVTOL)

Papers are sought addressing all areas related to the sciences, engineering, and technologies unique to Electric Vertical Takeoff and Landing (eVTOL) aircraft and Advanced Air Mobility (AAM) infrastructure of the future. Topics of interest include:

- Advanced on-board electric power systems: Batteries, hydrogen fuel cells, hybrid-electric engines, transmission and distribution, heat rejection
- Infrastructure: Vertiports, airspace insertion, fast-charging, airspace navigation, hydrogen infrastructure and standards Manufacturing and supply chain: Large-scale

manufacturing processes, automation, and global supply chain considerations for eVTOL/AAM
- Economics: Missions, demand modeling, and various costs
- Problems of safety: Crash egress, high-voltage, fire, cyber- and physical- vulnerability Testing and validation: Flight, wind-tunnel and model-testing of eVTOL aircraft and sub-systems
- Standards, regulations, and certification: Development of standards, regulatory frameworks, and certification pathways for eVTOL/AAM
- Human factors and autonomy: Pilot interface and pilot/crew training including automation and autonomy
- Environment and operational considerations: Urban aviation environment, micro-climatology, high wind/gust operations
- Other topics unique to eVTOL aircraft and AAM

Session Chair: **Prof. Jayant Sirohi**, University of Texas Austin, sirohi@utexas.edu

Deputy Session Chair: **Matthew Hasbun**, Advanced Rotorcraft Technology, matt.hasbun@flightlab.com

HANDLING QUALITIES

Papers are sought addressing all aspects of VTOL aircraft handling qualities from basic research through engineering design and development to implementation, verification, qualification, and certification in piloted simulation and flight tests. Handling Qualities comprise all of the aircraft characteristics that govern the ease and precision with which a pilot or uncrewed system is able to perform tasks required by various aircraft missions and under special operational or environmental conditions. This includes vehicle stability and control/response characteristics, flight guidance and control systems, and the pilot vehicle interface.

There is particular interest in investigating and expounding on the influence these systems have on piloting strategies and pilot workload as driven by task demands. Papers that address significant results from:

- Research, development and design of advanced systems and approaches/means to improve handling qualities with respect to operational needs and experience
- Impact of handling qualities on safety considerations, and work related to handling qualities of unconventional vertical flight configurations (e.g. eVTOL)
- Handling qualities of remotely piloted, uncrewed, and autonomous systems of all sizes as defined by mission performance measures, or other relevant metrics

Session Chair: **Benjamin Williamson**, Archer Aviation, jamin@pobox.com

Deputy Session Chair: **Dr. Tom Berger**, US Army, tom.berger2.civ@army.mil

HISTORY

The History Committee invites scholarly papers and first-hand accounts that facilitate the preservation and understanding

of the world's vertical flight history. Of particular interest are papers documenting important but not well-known developments in vertical flight technologies or vehicles, rediscovery of forgotten pioneers, or events involved in understanding specific phenomena. Accounts of early efforts of developing the helicopter industry and/or interactions with the Vertical Flight Society are also encouraged, and personal involvement in the subject matter or extensive research and documentation are highly desirable. Exceptions can be made to the no-paper/no-podium policy for first-hand accounts.

In general, technical survey papers should be submitted to the appropriate technical committee and not the History Committee. To be considered by the History Committee, proposed technical survey papers should contain a significant historical perspective and be discussed in the abstract.

Session Chair: **Erasmo Piñero,** Retired, bpinero@frontier.com

Deputy Session Chair: **Jacques Virasak,** R1202, LLC, jacques@r1202.c

INTEGRATED VEHICLE HEALTH MANAGEMENT (IVHM)

Papers are sought addressing integrated vehicle health management (IVHM), and condition-based maintenance (CBM), as they support total lifecycle value (sustainment, operational availability, etc.) of crewed and uncrewed vertical flight platforms. Topics of interest include:

- Advanced monitoring technologies to support aircraft health and condition assessment, including sensors, data acquisition and processing, diagnostic and prognostic algorithms, artificial intelligence, machine learning (deep learning), onboard system architecture with IVHM/HUMS integration, wireless communication and energy harvesting
- Advanced life and usage assessment techniques, including modeling, analysis, and data fusion
- IVHM/HUMS enabled paradigm shifts in aircraft design (IVHM/HUMS as a cyber-physical system), maintenance practices, and operations planning (logistics)
- Aircraft (onboard) and ground (offboard) decision support system/tools implementation including verification, validation, and certification/qualification, including IVHM/HUMS-related cyber security
- Success stories including improvements in operational availability, safety, costs, and maintenance benefits
- The application areas are propulsion, drive systems, structures, rotor systems, vehicle management system/flight control, electrical and electronic systems, as well as cross system integrated solutions
- Modeling and simulation that utilizes integrated vehicle health management, condition-based maintenance to facilitate realistic total lifecycle value (sustainment, operational availability, etc.) of crewed and uncrewed vertical flight platforms

Session Chair: **Katie Krohmaly**, US Navy, katie.g.krohmaly.civ@us.navy.mil

Deputy Session Chair: **Rohin Majeti**, German Aerospace Center (DLR), rohin.majeti@dlr.de

MANUFACTURING TECHNOLOGY & PROCESSING

The US Department of Defense's rotary-wing Future Vertical Lift (FVL) efforts, as well as numerous modernization programs across legacy fleets, consist of multiple mission sets covering requirements across the military services. In addition, the world of eVTOL concepts also continues to grow. High production rates are anticipated in both areas, with thousands of units per year, far greater than historical aircraft procurement rates. New and novel manufacturing approaches are vital to achieving the most cost-effective implementation of technologies to meet industry needs. Papers are sought addressing topics that are to be employed in the FVL program, legacy fleet modernization, as well as eVTOL aircraft concepts, such as:

- High-rate automated manufacturing
- Additive manufacturing
- Augmented reality assembly
- Nano- and micro-scale machining
- Adaptive and smart manufacturing equipment and systems
- Manufacturing modeling and simulation
- Resource efficient factory design
- Data management for increased production
- Human centered manufacturing (designing workplaces of the future)
- Networked factories linking supply chains to local production
- Regulatory impacts and environmental issues
- Quality assurance approaches (including non-destructive evaluation/inspection techniques), applications of innovative process measurements, Cost of Quality (CoQ), Total Quality Management (TQM), and Quality Control Management (QCM) in manufacturing
- Process Improvement Methods including Six Sigma and Theory of Constraints.
- Advanced bonding, joining, and assembly techniques
- Metallic and/or composite repair
- Accelerating readiness levels
- AAM and eVTOL power and drive manufacturing techniques pertaining to motor, battery, motor controller, etc.
- Manufacturing/Integration affordability and producibility

Session Chair: **Dr. Davide Piovesan**, Gannon University, piovesan001@gannon.edu

Deputy Session Chair: **Luke Warpinski**, The Boeing Co., lgwarpinski@gmail.com

MODELING & SIMULATION

Papers are sought addressing the application of Modeling and Simulation (M&S) to the future of vertical flight, VTOL aircrew flight training and rehearsal, flight operations, design, and safety and certification requirements. Topics of interest include:

Improving VTOL safety and operations quality assurance through flight simulation

MODELING & SIMULATION (CONTINUED)

- Rigorous quantification of benefits and ROI of flight modeling and simulation for design, flight-testing, training, and other activities compared to traditional practices
- Application of M&S to improve design, flight test, and certification; and to support virtual engineering lifecycle concepts for VTOL aircraft, especially rotorcraft
- Specialized topics in physics-based modeling, system identification, model-based control architectures,
- and simulation/simulator verification and validation with respect to ADS-33E-PRF, 14 CFR Part 60, CS-FSTD(H) or similar standards
- Flight modeling and simulation of sling loads, urban mobility, alpine operations, shipboard launch and recovery, degraded visual environments, and other unique operational challenges
- Application of flight modeling and simulation to eVTOL aircraft; advanced lifting mechanism for rotor, wing, or body; and other future vertical lift aircraft configurations
- Rotorcraft simulator fidelity ratings, fidelity metrics, pilot cueing requirements for specific air vehicle configurations or mission tasks, transfer of training, and application of simulation to study pilot-rotorcraft interactions
- Advanced or novel simulation technologies, including VR and XR technologies, in-flight simulation, parallel computing for real time simulation, and distributed simulation
- Application of Machine Learning and AI to modeling aspects, such as corrections to physics-based approaches

Session Chair: Paul Redkoles, The Boeing Co., paul.l.redkoles@boeing.com

Deputy Session Chair: Dr. Giuseppe Quaranta, Politecnico di Milano, giuseppe.quaranta@polimi.it

OPERATIONS & INFRASTRUCTURE

Papers are sought addressing the topics below in civil, commercial & military areas. Also welcome, any papers which encompass disciplines affecting current and future operations & operability of rotorcraft, eVTOL, VTOL, and UAS. Topics of interest include:

- Concepts of Operations (CONOPS)
- Air Traffic Management (ATM) and Uncrewed Traffic Management (UTM)
- Advanced Air Mobility (AAM) operations
- AAM/eVTOL in military and civilian applications
- Lessons learned from deployed operations
- Operations in Degraded Visual Environment (DVE)
- Offshore, public safety, emergency medical service, firefighting, and search and rescue operations
- Manned-unmanned operations
- Innovations in infrastructure to enhance safety, optimize capacity and expand capabilities
- Vertical flight survivability, vulnerability and operational effectiveness analyses using modeling and simulation
- Tools, technologies, and methodologies
- Trade study analysis approaches
- Optimization analysis (optimization of aircraft usage, scheduling, network, search pattern, etc.)
- Force structure and fleet size analysis
- Artificial intelligence/machine learning impacts on operations
- Electronic decision-aids/aiding
- Command, control, and communications
- Intelligence and electronic data gathering applications
- Infrastructure security and cybersecurity
- Low altitude weather reporting, dissemination, simulation, technology, and integration
- Infrastructure fire safety technologies and advancements
- Infrastructure design optimization, simulation and modeling

Session Chair: Shawn Melhorn, Sikorsky, a Lockheed Martin Co., shawn.p1.melhorn@lmco.com

Deputy Session Chair: Paul Kennard, Heliops Magazine, paul@kiakahamedia.com

PRODUCT SUPPORT SYSTEMS

Papers are sought addressing the development or application of technology, processes and innovations that support vertical lift operators and maintainers, including eVTOL systems. Note that many of the technologies that have been presented in previous Forum sessions and have now been successfully fielded are excellent candidates to present in the Product Support sessions going forward. All fielded technology, processes and innovations end up supporting the operator or maintainer. Topics of interest include:

- Design for Reliability and Maintainability
- Platform Maintenance Applications (PMA)
- UID / IUID Integration
- Predictive Maintenance Systems
- HUMS-Derived Maintenance Management
- Condition Based Maintenance (CBM)
- Maintenance Free Operating Period (MFOP)
- MSG-3 and Reliability Centered Maintenance (RCM)
- Fleet data management & data analytics
- Development of new repair technologies
- Damage-tolerant systems support
- Sustainment and sustainable technologies
- eVTOL logistics development and support
- 3D and augmented reality technical publications
- Performance Based Logistics (PBL)
- Lessons learned from deployed operations
- Fleet Information Management (FIM)
- Flight Operations Quality Assurance (FOQA)
- Site activation
- Austere-fielded support programs
- Pre-operational support planning
- Service center support
- Training and training facilities
- Increasing the life of legacy systems
- Rapid prototyping for legacy, out-of-production spares

Session Chair: Thomas Cieslewski, Kamatics Corporation, thomas.cieslewski@kaman.com

Deputy Session Chair: Daniel Amodeo, Sikorsky, a Lockheed Martin Co., daniel.j.amodeo@lmco.com

PROPULSION

Papers are sought addressing new and innovative information on propulsion for vertical takeoff and landing (VTOL), vertical/short takeoff and landing (V/STOL), electric VTOL (eVTOL), and uncrewed VTOL aircraft, including unique propulsion configurations, component developments, and new, enabling technologies. Please limit Propulsion abstracts to two pages or less. Recommended topics include:

- Rotorcraft engines
- Rotorcraft drive systems
- Platform primary power and energy management
- eVTOL propulsion units and configuration studies
- Propulsion system integration and thermal management
- Related airframe/engine technologies

Areas of specific interest include topics addressing recent approaches or technologies that: Enhance safety, including fail safety or improvements to component modeling and test

- Improve performance, including weight, efficiency, power, or fuel consumption
- Use novel methods for providing or managing propulsion power for eVTOL or AAM applications
- Employ alternatives to conventional rotorcraft propulsion/drive systems, including hybrid/electric drives, batteries, fuel cells, and electric motors, and their integration
- Reduce propulsion contribution to fuel/energy cost and environmental footprint, including novel propulsion systems or energy sources (electric propulsion, hydrogen fuel, etc.)
- Integrate alternative fuels and lubricants, including sustainable aviation fuel (SAF) into existing or novel propulsion units
- Use hydrogen fuel or alternate lubricants for electric aircraft
- Advance novel approaches to propulsion design which improve system power density, including conventional, hybrid electric, fuel cell system, and electric motor designs
- Investigate size, weight, cost, or complexity of achieving fail-safety in novel propulsion designs
- Provide methods, design, or analyses that improve propulsion system reliability
- Compare fail-safe designs to damage tolerant designs and the safety/reliability impacts thereof
- Enable a reduction in customer componentrepair/replacement burden
- Provide a reduction in operations and sustainment costs
- Present weight/noise reduction opportunities or advancements

Other topics include:

- System integration considerations related to environmental impacts and requirements

- Integrated/advanced electronic control systems (to include sensors)
- Advanced materials, gear, and bearing technology
- Shafting advancements
- Alternative fuels and lubricants
- Simulation to enhance propulsion systems and subsystems
- Detail design tools that support the above technologies
- Creative validation/testing methods aimed at reductions in development/qualification costs
- Advances in engine sand separation or inlet protection

Session Chair: **Noah Becker**, Sikorsky, a Lockheed Martin Co., noah.g.becker@lmco.com

Deputy Session Chair: **Jason Boyer**, The Boeing Co., jason.boyer@boeing.com

SAFETY

Papers are sought addressing technologies and processes for the prevention of vertical flight accidents in the design, testing and operational stages. Topics of interest include:

- Transformative designs/ technologies which enhance safety, such as autonomous crewing and distributed propulsion
- Technology solutions addressing accident causal factors
- Technology solutions to critical commercial, private, and military aircraft hazards
- System Safety Engineering processes that identify and mitigate hazards
- Safety Risk Management efforts which proactively identify and address potential accident causes risks to aircraft safety
- Safety Risk Assessment processes and emerging SMS improvements
- Flight data analytics and machine learning to enhance safety of rotorcraft operation
- Operational management techniques that reduce accident causes or severity
- Lessons learned and mitigation strategies resulting from flight data and crew monitoring technologies
- Lessons learned and recommendations regarding pilot training to mitigate safety hazards
- Accident investigation techniques and technologies — specifically those which fill existing gaps in knowledge

Key technology areas of interest include:

- Enhanced vision systems
- Advanced terrain and traffic avoidance systems
- Automated and real time risk assessment systems
- Real time aircraft analytics
- Weather hazards, such as inadvertent flight into IMC prevention
- Crew and passenger safety (other than crash safety, which should be submitted to the Crash Safety technical committee)

Session Chair: **Dr. Alexia Payan**, Georgia Institute of Technology, alexia.payan@gatech.edu

Deputy Session Chair: **Paul Inguanti**, Sikorsky, a Lockheed Martin Co., paul.c.inguanti@lmco.com

STRUCTURES & MATERIALS

Papers are sought addressing the development, design, analysis, testing, service experiences, or novel application of structures and materials to crewed and uncrewed rotorcraft, powered lift, and fixed-wing V/STOL aircraft. Topics of interest include:

- Structural issues of eVTOL implementations
- Durability and damage tolerance
- Fatigue and fracture mechanics
- Impact mechanics
- Advanced metallic and composite materials and structures
- Probabilistic mechanics and structural reliability methods
- Repair concepts and methodology
- Structural integrity assurance via health monitoring and non-destructive evaluation
- Stress and finite element modeling and analysis
- Structural design criteria, loads development, and optimization
- Verification and validation of structural methodologies
- Certification of rotorcraft structural parts
- Prediction of structural failure, required maintenance, and remaining life via digital twin and other methodologies

Other related topics include:

- Affordability, weight reduction, material and structural qualification, and stress prediction accuracy improvements
- Practical applications of high strain, high durability, or adaptive materials to advanced structural concepts for improved performance or affordability

Session Chair: **Dr. Suresh Moon**, Technical Data Analysis, Inc., smoon@tda-i.com

Deputy Session Chair: **Colton Marchesseault**, The Boeing Co., colton.j.marchesseault@boeing.com

SYSTEMS ENGINEERING

Papers are sought promoting system design, system development, system integration, and life cycle management within the engineering design process for crewed, uncrewed, or optionally crewed vertical flight aircraft. This includes papers with topics relating to system engineering tools, systems processes, MBSE, architecture, AI, cyber security, and other subject areas that address problems unique to trade-offs and optimization across the design life cycle.

Topics of interest include:

- Artificial Intelligence for Systems Engineering (AI4SE)
- Systems Engineering for Artificial Intelligence (SE4AI)
- Model-based system engineering (MBSE)
- Cybersecurity — system level security
- Digital engineering
- System architecture
- “System thinking” application and benefit
- System verification and validation
- System certification and qualification
- System modeling and simulation
- Program/project management for system-of-systems
- Risk management
- Systems engineering education and training
- Systems engineering tools, processes and best practice
- Systems engineering quality management
- Reliability and maintainability

Session Chair: **Kurt Kuhn**, The Boeing Co., kurt.i.kuhn@boeing.com

Deputy Session Chair: **Dawn Verlander**, The Boeing Co., dawn.verlander@gmail.com

TEST & EVALUATION

Abstracts for Test & Evaluation should be a minimum of 3 pages. Abstracts will be evaluated based on the appropriateness of the work to the vertical flight industry, originality, technical quality, availability of (preliminary) results and completion status. Scientific and quantifiable data, illustrating applied methodologies and evaluation of advanced technologies and vehicles are highly desirable. Status, including milestones of any pending research/work required for the completion of the paper, should also be included.

Papers are sought addressing all aspects of legacy and future VTOL aircraft test and evaluation, including testing of advanced technologies (components and subsystems) and vehicles (crewed and uncrewed), both full- and model-scale, in laboratory, wind tunnel, ground, and flight-test scenarios. Other topics that are encouraged:

- Activities performed in representative operational and environmental conditions
- Aspects of the complex flight envelopes of conventional and unconventional vertical lift vehicles (low-speed, transition, maneuvering, conversion, and high-speed)
- Testing techniques involving vehicle safety in aspects of technological design, scientific evaluation, event investigation, and airworthiness compliance

Session Chair: **Christopher Cameron**, US Army, christopher.g.cameron.civ@army.mil

Deputy Session Chair: **Mark A. Miller**, Pennsylvania State University, mark.a.miller@psu.edu

Vertical Flight Society